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(58) Field of Search
UK CL (Edition S) F4R
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(54) Abstract Title
Lights displaying braking intensity

(57) A visual warning system for vehicles utilises a sensor 7 that detects the vehicle's braking intensity (rate of deceleration) and transfers that information to a display unit 1 illuminating a series of luminaries 3 progressively / sequentially and in direct proportion to the vehicle's braking intensity (rate of deceleration).

Should the vehicle's ABS ('Anti-Lock Braking System' or similar if applicable / wheel lock-up) be activated, a further visual warning would be given (Fig. 7) in the form of a strobe-like pattern.

If a concentric pattern of illumination (from the middle towards the extremities) is utilised, reflective surfaces or pilot lights 6 would be fixed to the extremities of the display unit 1, and act as visual guides showing how close the vehicle is to dangerously heavy breaking / decelerating.

FIG. 1

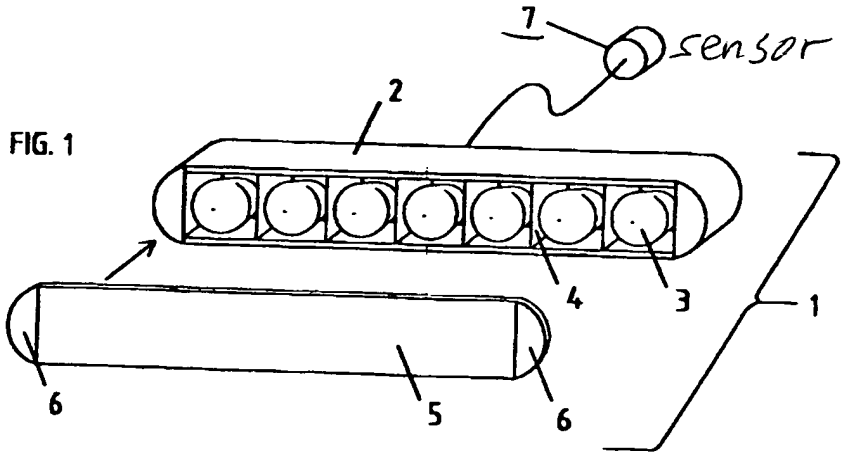

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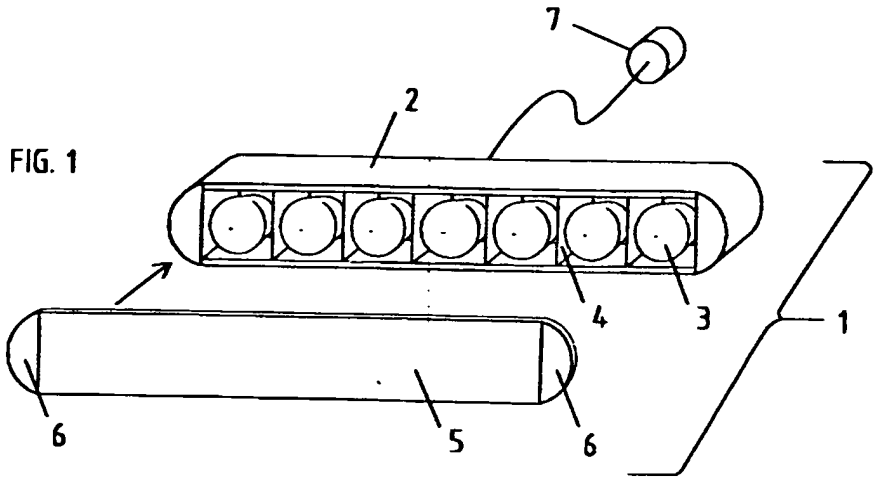
FIG. 1



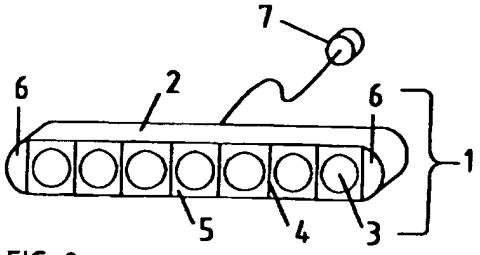


FIG. 2

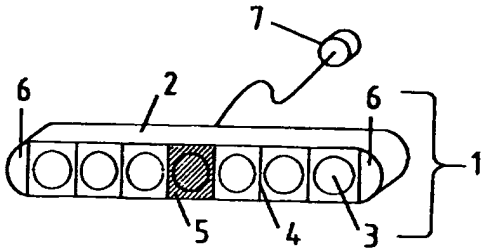


FIG. 3

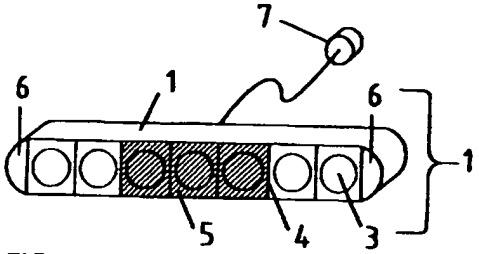


FIG. 4

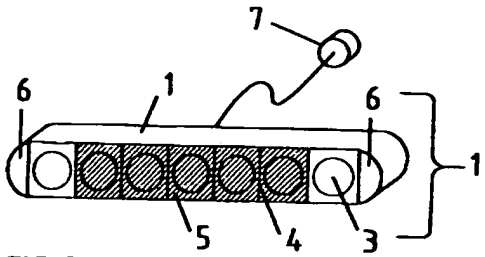


FIG. 5

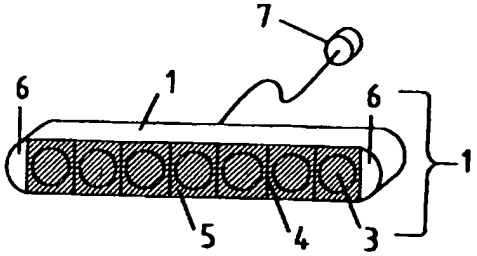


FIG. 6

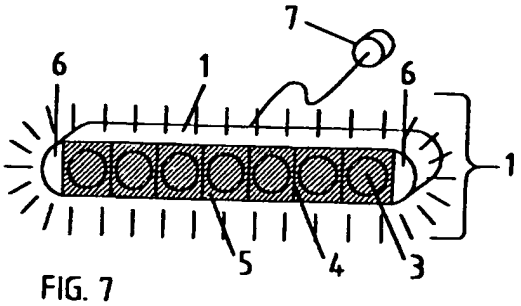
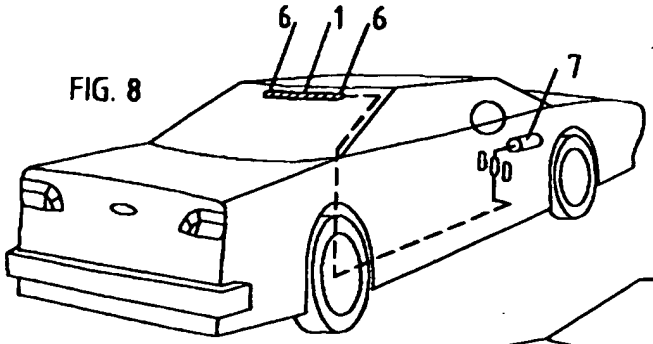


FIG. 7

FIG. 8



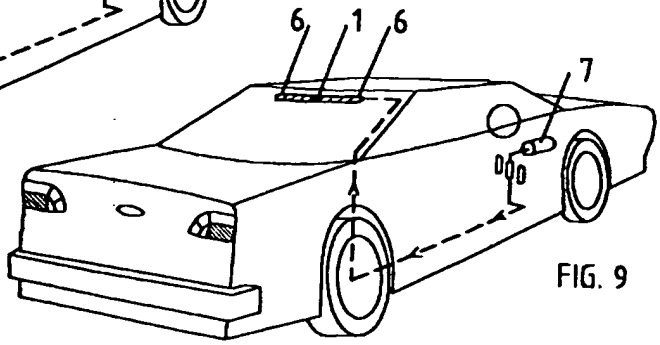
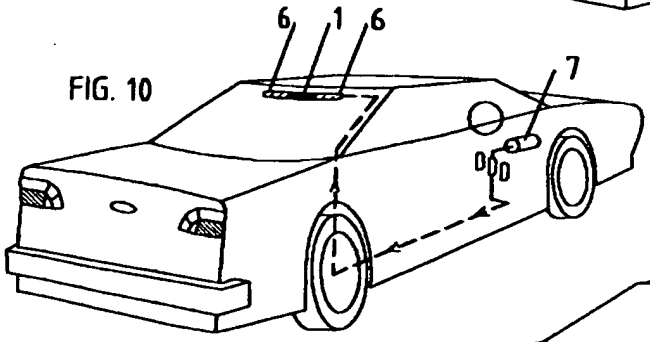


FIG. 9

FIG. 10



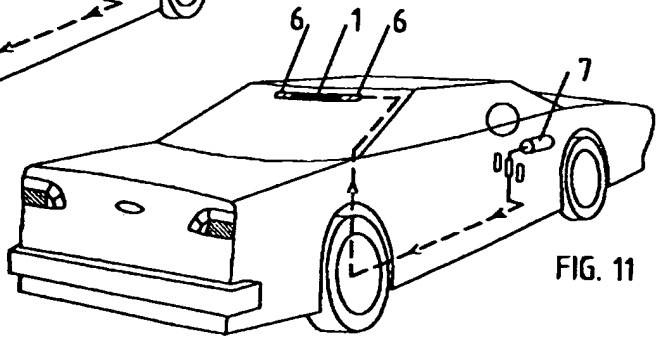
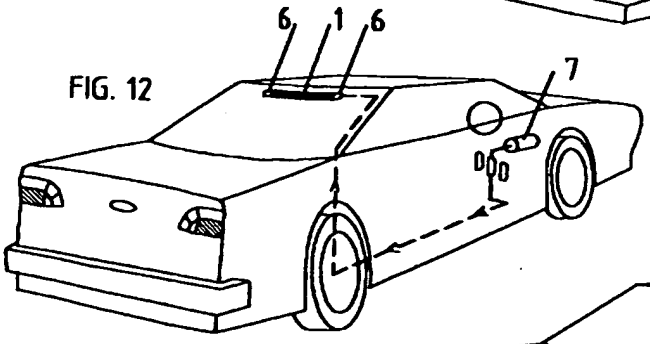


FIG. 11

FIG. 12



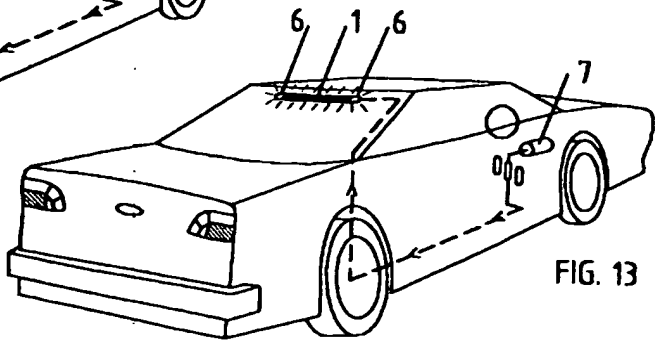


FIG. 13

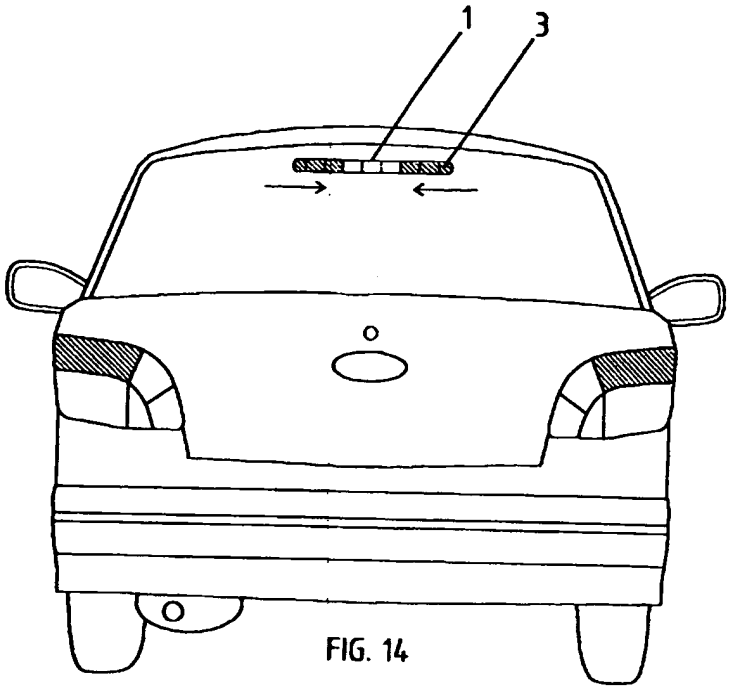


FIG. 14

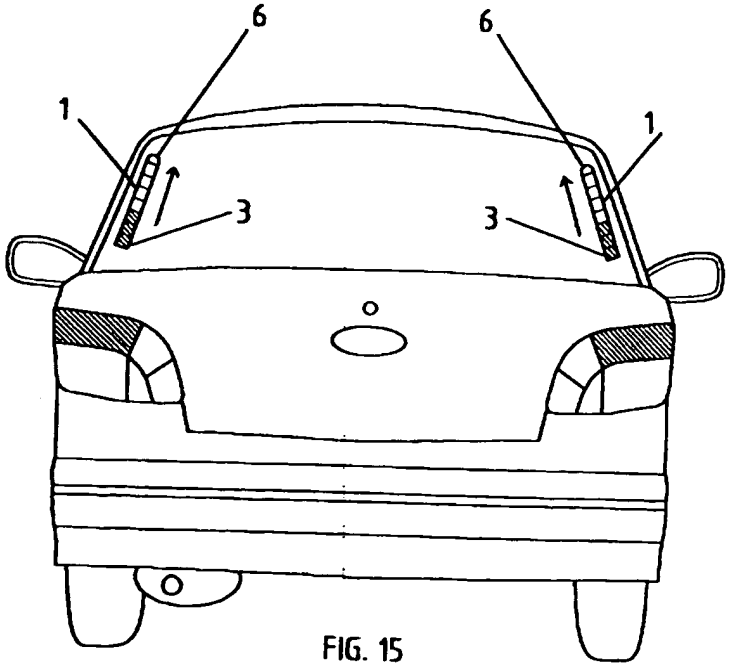


FIG. 15

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ABL

The ABL is a visual aid safety device designed to be used on all types of motor vehicles.

In today's world the number and variety of road vehicles is on the increase, and so too are the numbers of road related accidents and fatality's.
As vehicles get faster and faster, they employ ever more elaborate and sophisticated braking systems, yet the only part of this system not to evolve is the break lights themselves.

The current break lights fitted to all road vehicles show only that the vehicle's brakes have been applied, but not how heavily.
The ABL (Advanced warning Break Light system) is a visual warning safety device that will show the breaking intensity (rate of deceleration) of any motor vehicle, including all types of trailers and street trams.
This invention will enable the driver of a pursuing vehicle to see how heavily the vehicle in front is applying its breaks (decelerating), therein receiving a vital warning to any potential hazard in advance.
All motorists would benefit from the ABL and hopefully render rear-end shunts and multiple car pile-ups a thing of the past.

The ABL consists of a display unit and sensor.
The sensor detects the amount of pressure exerted through the vehicle's breaking system (rate of deceleration) and transfers that information to a display unit mounted to the rear of the vehicle and in clear view of all pursuing motorists.
The display unit houses a series of luminaries which are individually / sequentially activated and in direct proportion to the vehicle's breaking intensity (rate of deceleration).
The more pressure exerted through the vehicle's braking system (the quicker the rate of deceleration) the more luminaries are progressively / sequentially illuminated.
In the event of very heavy breaking (deceleration) all of the luminaries would eventually illuminate and create a solid (red) illuminated bar.
If the vehicle's ABS ('Anti-Lock Braking System' or similar if applicable / wheel lock-up) engages, the now illuminated solid bar would begin to flash on-and-off in a strobe-like pattern.

The ABL shows not only how hard the breaks are being applied, but also at what speed.
Heavy, progressive breaking (slowly but firmly), and heavy rapid breaking (slamming on the breaks) are two very different things even though the intensity is the same in both cases.

The Inventions size, configuration, colour and materials are limited only by the manufacturers imagination and the drivers needs.
Larger versions would be made for Busses, Lorries, HGV's, Trams, etc. and smaller versions for Motorcycle's and Mopeds.
Some of the aforementioned (being externally mounted) are able to brave the elements, i.e. are waterproof / water-resistant.
For standard road vehicle's the display unit's housing would preferably be moulded in various coloured plastics to match the interior, but could be made from any other practical materials, i.e. aluminium (which could then be painted) etc. or a combination of these materials.

The ABL would be both factory fitted on new vehicles and retro fitted on older vehicles.

A preferred embodiment of the invention will now be described with reference to the accompanying drawings in which:

FIGURE 1 shows the ABL and it's basic components.

FIGURE 2 to FIGURE 7 shows how the ABL works during a typical heavy breaking (maximum deceleration) manoeuvre.
Illumination in a concentric pattern (from the middle towards the extremities) is shown.

FIGURE 8 to FIGURE 13 show how the ABL will function mounted on a standard road car.
Illumination in a concentric pattern (from the middle towards the extremities) is shown.

FIGURE 14 shows a variation in the order of luminary illumination of the display unit.
Illumination in an eccentric pattern (from the extremities towards the middle) is shown.

FIGURE 15 shows another variation in the order of luminary illumination of the display unit.
Illumination in a linear pattern (in pairs of lighting display units) is shown.

As shown in Figure 1, the ABL comprises a display unit 1 (2 - 6) and sensor 7.
The display unit 1 comprises a housing 2 in which are a series of luminaries 3.
The luminaries 3 are compartmentalised by reflective walls 4 insuring there is no light pollution between luminaries and maximising light emission.
In the case of utilising LED's as light sources the walls 4 would not be needed.

The luminaries 3 are individually / sequentially activated and in direct proportion to the vehicle's breaking intensity (rate of deceleration) by a sensor 7 which detects the vehicle's breaking intensity (rate of deceleration) and it's ABS ('Anti-Lock Braking System' or similar if applicable / wheel lock-up) and illuminates the luminaries accordingly.

The front of the housing 2 is covered by an optional sheer plastic screen 5 which would be clear if coloured luminaries 3 are used, and coloured if clear luminaries 3 are used.

The housing 2 (or screen 5) has reflective panels 6 ('cat's eyes' or similar) at each extremity which act as guides, indicating how closely the vehicle is to dangerously heavy braking (deceleration). This is especially useful at night or in conditions of reduced visibility.
Pilot lights are an alternative to using reflective surfaces 6.

The display unit 1 is attached to the vehicle in a similar fashion as existing high mounted auxiliary break lights.

Figures 2 to Figure 7 shows the typical illumination sequence the luminaries 3 would go through during a heavy breaking (rapid deceleration) manoeuvre.

The number of luminaries can vary but for explanatory purposes the following example will employ seven number luminaries and will show them illuminating in a concentric pattern (from the middle towards the extremities).

Figure 2 shows no luminaries illuminated. Normal driving, no braking / deceleration.

Figure 3 shows one (central) luminary has been activated. Light breaking / deceleration.

Figure 4 shows two additional luminaries have been activated (either side of the first luminary).
Medium breaking / deceleration.

Figure 5 shows a further pair of luminaries activated (either side).
Medium to heavy breaking / deceleration.

Figure 6 shows all the luminaries creating a solid illuminated bar.
This means heavy breaking / deceleration. Caution.

Figure 7 shows the solid illuminated bar flash on and off in a strobe-like pattern. This means the Vehicle's ABS ('Anti-Lock Braking System' or similar if applicable / wheel lock-up) has been activated. Danger. Potential hazard.

If a vehicle has to suddenly break / decelerate very heavily, the ABL's display unit would go through the entire sequence shown in Fig. 2 to Fig. 7.
If for example this entire sequence takes four seconds, that would mean the driver is applying the brakes heavily but in a controlled, slow progressive fashion.
If the same sequence took less than one second, the driver has slammed the breaks on hard.

FIGURE 8 to FIGURE 13 show how the ABL would function mounted on a standard road car.
Illumination in a concentric pattern (from the middle towards the extremities) is shown.

FIGURE 8 relates to FIGURE 2.

FIGURE 9 relates to FIGURE 3.

FIGURE 10 relates to FIGURE 4.

FIGURE 11 relates to FIGURE 5.

FIGURE 12 relates to FIGURE 6.

FIGURE 13 relates to FIGURE 7.

FIGURE 14 shows a variation in the order of luminary illumination of the display unit.
Demonstrated is illumination in an eccentric pattern (from the extremities towards the middle).
The arrows show the direction in which the luminaries 3 progressively illuminate.
In this case the need for reflective panels 6 (pilot lights) is eliminated.
Medium braking / deceleration is currently demonstrated (relate to Fig. 4 / Fig. 10)

FIGURE 15 shows another variation in the order of luminary illumination of the display unit.
Demonstrated is illumination in a linear pattern (in pairs of lighting display units).
The arrows show the direction in which the luminaries 3 progressively illuminate.
In this case a pair of lighting displays would be used, and only one reflective panel 6 (pilot light) per unit is needed.
Medium braking / deceleration is currently demonstrated (relate to Fig. 4 / Fig. 10)

CLAIMS

1. A visual warning safety device that shows the breaking intensity / rate of deceleration of any motor vehicle (including all types of trailers and street trams) utilising a sensor that detects the vehicle's rate of deceleration and transfers that information to a display unit illuminating a series of luminaries progressively / sequentially and in direct proportion to that vehicles breaking intensity / rate of deceleration.

2. A visual warning safety device as claimed in claim 1 where an additional visual warning in the form of a strobe like pattern would be given if the vehicle's ABS ('Anti-Lock Braking System' or similar if applicable / wheel lock-up) engages.

3. A visual warning safety device substantially as herein described and illustrated in the accompanying drawings.

INVESTOR IN PEOPLE

Application No: GB 0127990.0 **Examiner:** Colin Clarke
Claims searched: 1-3 **Date of search:** 18 March 2002

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.T): F4R

Int Cl (Ed.7): B60Q 1/44

Other: ONLINE: WPI, EPODOC, JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	GB 2329704 A	DESIGN TECHNOLOGY see p4 line 29-p5 line 11	1
X	GB 2245351 A	DONNACHIE see whole document	1
X	EP 0957000 A	NEWTON see whole document	1
X	WO 96/37381	BUZDYGAN TECHNOLOGIES see p5 lines 4-35	1 & 2
X	WO 93/15931	INTERNATIONAL AUTOMOTIVE DESIGN see fig 1 & p4 para 8	1
X	Derwent Abstract 2000-603088 & DE19910762 A RIES		1
X	Derwent Abstract 1999-303551 & DE19746561 A WIEMANN		1 & 2
X	Derwent Abstract 1996-465593 & DE19513514 A HAINES		1

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